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EFFECTS OF INJECTIONS OF HOMOLOGOUS STREPTOCOCCI, KILLED BY HEAT, IN STREPTOCOCCUS COMPLICATIONS IN CONTAGIOUS DISEASES.*

GEORGE H. WEAVER AND RUTH TUNNICLIFF.

(From the Memorial Institute for Infectious Diseases, Chicago.)

IN view of the striking results reported to have followed the injection in persons suffering from various infections, of bacteria killed by heat according to the method advocated by Wright, it was thought desirable to test this method of treatment in patients with streptococcus complications in contagious diseases, especially in scarlatina.

We have seven such cases to report.

The bacteria injected were grown upon serum agar slants for 24 hours at 35° C. They were then suspended in 0.85 per cent sodium chloride solution and killed by heating to 60° for 30 to 45 minutes. In each instance cultures from the suspension after heating showed it to be sterile. The number of bacteria in the suspension was determined by Wright's method. The culture was always obtained from patient to be treated, from the purulent discharge from the abscess, the ear, or nose, or from the surface of the tonsil. Determinations of the opsonic index were made by Wright's method, the cultures from the individual being usually employed, although the indices closely corresponded, whatever streptococcus was used. The index was usually estimated daily and served as a guide to the injections. A pronounced fall in the index following the injection was rarely observed, but more or less rise was found after each injection except one. Slight local tenderness usually was found present at the place of injection for a day or two, and occasionally the local reaction was quite pronounced. Some idea of the character of the cases and their course can be gleaned from the following brief notes from the case records.

Case I.—Girl, age 5 years. Convalescent scarlatina. January 13, 1907: Profuse purulent discharge of four weeks' duration from a sinus following suppuration in the cervical lymph glands. 500,000,000 killed streptococci injected.

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January 16: Discharge much less.

January 17: Discharge very slight. 500,000,000 killed streptococci injected.

January 20: Very little discharge.

January 21: 300,000,000 killed streptococci injected.

January 22: Developed chicken-pox. Discharge from sinus increased. Temperature 101° F.

January 28: 300,000,000 killed streptococci injected. Slight discharge continued for a month after the last injection during which time the opsonic index remained almost constantly above normal. (Chart 1.)

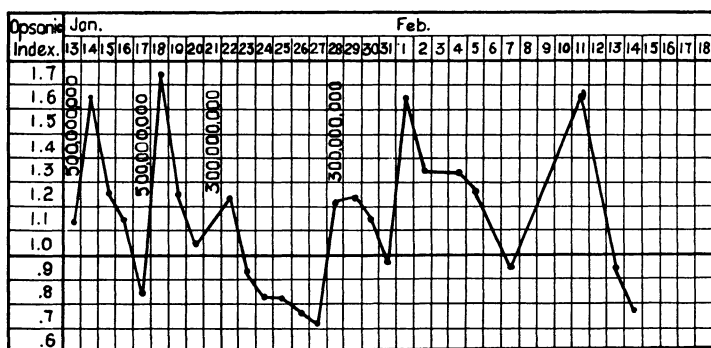


CHART 1.—Streptococco-opsonic index in Case I, with approximate numbers of bacteria injected.

Case II.—Boy, age 4 years. Cellulitis of the neck following diphtheria. January 15, 1907: Large, acutely swollen mass on the side of the neck was incised. No pus was found but cultures yielded abundant streptococci in pure culture.

January 17: A second incision opened a small pocket of pus.

January 19: 350,000,000 killed streptococci were injected.

January 25: 250,000,000 killed streptococci were injected.

January 30: Discharge almost ceased.

February 2: Discharged from hospital, the incision being almost healed. (Chart 2.)

Case III.—Girl, age 5 years. Scarletina at end of first week, with profuse nasal discharge and much swelling of the cervical glands.

January 21, 1907: 250,000,000 killed streptococci injected.

January 22: Nasal discharge less; no change in glands.

January 25: 170,000,000 killed streptococci injected.

January 27: Nasal discharge much less.

January 28: 170,000,000 killed streptococci injected.

January 29: Nasal discharge stopped. Glands but little enlarged. Uneventful recovery.

Case IV.—Girl, age 3 years. Scarletina at end of first week.

January 16, 1907: Glands on both sides of neck much swollen and hard. 600,000,000 killed streptococci injected.

January 19: Swellings incised; no pus found.

January 20: 300,000,000 killed streptococci injected.

January 22: Purulent discharge from incisions; general condition improved.

January 23: 250,000,000 killed streptococci injected.

January 26: Profuse hemorrhage from wound in neck.

January 27: Patient died.

Each injection was followed by a fall succeeded by a rise in the opsonic index.

Case V.—Woman, 20 years. Scarletina at end of first week.

January 21, 1907: Moderate enlargement of cervical lymph glands. 350,000,000 killed streptococci injected.

January 24: Glands more swollen and tender. 350,000,000 killed streptococci injected.

January 30: Glands much reduced in size. 350,000,000 killed streptococci injected. Uneventful recovery.

Case VI.—Boy, age 8 years. Scarletina, ten days after onset.

January 13, 1907: Fairly well-marked enlargement of the cervical lymph glands. 500,000,000 killed streptococci injected.

January 16: Glands much reduced in size and less tender and not so hard to the touch.

January 17: 500,000,000 killed streptococci injected.

January 22: Glands not tender and barely palpable.

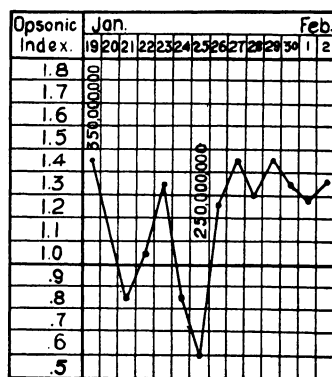


CHART 2.—Streptococco-opsonic index in Case II, with approximate number of bacteria injected.

In this case the glands were reduced in size much more rapidly than those in the case of the brother who received no injections. The conditions in the two patients before the injections were begun were very similar. (Chart 3.)

Case VII.—Man, 20 years. Suppurative otitis media, following scarlatina of a month previous.

January 31, 1907: 170,000,000 killed streptococci injected.

February 2: Discharge reduced about one-half.

February 5: 85,000,000 killed streptococci injected.

February 6: Aural discharge less.

February 8: Aural discharge stopped. (Chart 4.)

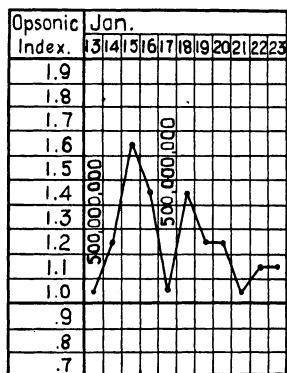


CHART 3.—Streptococco-opsonic index in Case VI, with approximate number of bacteria injected.

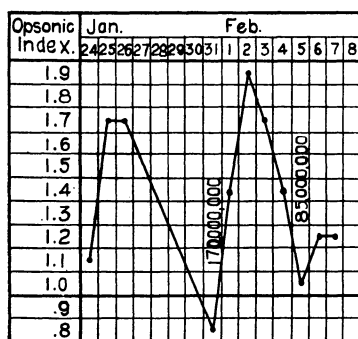


CHART 4.—Streptococco-opsonic index in Case VII, with approximate number of bacteria injected.

In watching these cases while under treatment it was very difficult to determine what effect, if any, upon the course of the disease could be ascribed to the injections. The impression, however, was obtained that in acute processes the effect was imperceptible. Because of the great variability in the natural course of these complications uninfluenced by treatment, it is almost impossible to judge the effects of treatment in individual cases. In some cases with enlarged glands which did not suppurate the recovery seemed to be accelerated. In arriving at our conclusions as to the effect of the injections upon the course of the infection, we have been guided by close observation of the cases, and by comparison with numerous uninjected cases. Dr. Baum, in whose service the cases occurred, and the resident physicians also formed the opinions expressed in our conclusions.